

REMARKS

Reconsideration is requested.

In this response, claim 45 has been amended, and new claims 66-67 added. Accordingly, claims 35-37, 40-63, and 65-67 remain pending in this application for reconsideration. Features of new claim 66 find support at least at page 7, lines 19-23 of the present specification.

Claims 35-37, 50, 56 and 62 stand rejected under 35 U.S.C. §112, first paragraph; and Claims 35-37, 40-63 and 65 stand rejected under 35 U.S.C. §103(a) as unpatentable over Thomas et al. article entitled "VLSI Multilevel Micro-coaxial Interconnects for High Speed Devices", in view of U.S. Patent Nos. 5,148,260 to Inoue et al. and 5,323,533 to Val.

In reviewing the attachments to this Office Action, it was noted that one item appearing in the "Other References" section on Page 1 of Applicant's PTO-1449 form, which was attached to an Information Disclosure Statement filed on September 13, 2002, was not initialed by the Examiner. Out of an abundance of caution, a duplicate copy of the PTO-1449 form, including a copy of the as-filed Information Disclosure Statement, is hereby submitted. To the extent this item listed on the PTO-1449 form has not already been initialed in the file, such examination and initialing is requested at this time.

Applicant respectfully traverses rejection of claims 35-37, 50, 56 and 62 under 35 U.S.C. §112, first paragraph. The Office Action alleges that "...outer conductive sheath is not formed on the outer surface..." recited in the above-noted claims is not described in the specification. Figure 13 of the present

specification clearly indicates that the outer conductive sheath 46 is not formed on the outer surface 18. Figure 13 further shows the outer conductive sheath 46 as formed over dielectric layer 44, the dielectric layer 44 being suspended above outer surface 18. See page 9, lines 1-3 of the present specification.

A void between the outer surface 18 and the outer conductive sheath 46 may be formed by elevationally removing the masking material from below the conductive material portions which extend between the terminal members 20, 21. See Figure 12 and page 7, lines 19-23 of the present specification. From the foregoing, it is clear to one skilled in the art that outer conductive sheath is not formed on the outer surface 18. Accordingly, withdrawal of rejection of claims 35-37, 50, 56 and 62 under 35 U.S.C. §112, first paragraph, is respectfully urged.

Claims 35-37, 40-63 and 65 stand rejected under 35 U.S.C. §103(a) as unpatentable over Thomas in view of Inoue and Val. This rejection is respectfully traversed.

Thomas discloses an interconnect scheme for micro-coaxial interconnect structures. The salient features of Thomas involve the sequential use of high conformality dielectrics and metals via chemical vapor deposition techniques to encapsulate a central metal conductor.

Claim 35 specifically recites a semiconductive substrate having an outer surface, an inner conductive core spaced from and suspended over the outer surface, a polymer dielectric layer surrounding a substantial portion of the inner conductive core, and an outer conductive sheath surrounding a substantial

portion of the polymer dielectric layer, wherein the outer conductive sheath is not formed on the outer surface.

Support can be found in Figure 8 and page 6, lines 12-14, Fig. 13, and page 9, lines 10-13 of the present specification.

The Office Action refers to Figs. 1(a) and 1(b) and makes a sweeping citation to Thomas' complete disclosure (3.5.1-3.5.2) as teaching claimed features. However, such statement is not substantiated by any citations to the reference as teaching specific claim elements. Merely citing a reference and then directing the applicant to review the complete disclosure of such reference does not satisfy the burden that is required to show obviousness. See *Kalman v. Kimberly-Clark Corp.*, 713 F. 2d 760, 218, USPQ 781 (Fed. Cir. 1983).

Thomas' Figure 1(a) merely shows an inner conductor surrounded by a dielectric which is further surrounded by a copper coaxial shield and Figure 1(b) shows interconnection of metal 1 to metal 2. Where is the substrate having an outer surface shown? Even assuming that there is a substrate, where is it shown that the inner conductive core is spaced from and suspended over the outer surface of the substrate. From Thomas' Figure 1(b), the inner conductor is not suspended over an allegedly not shown substrate. It is in fact shown as being connecting to some unknown element. Therefore, Thomas teaches away from the claimed invention. Additionally, the teachings of Thomas are rendered unsuitable for their intended purpose if adapted to provide the claimed invention. See MPEP §2143.01, entitled "Suggestion or Motivation to Modify the References."

Claim 35 further recites "...an outer conductive sheath surrounding a substantial portion of the polymer dielectric layer, wherein the outer conductive sheath is not formed on the outer surface."

Figure 13 of the present specification shows an outer conductive sheath 46 surrounding polymer dielectric layer 44, wherein the outer conductive sheath 46 is not formed on the outer surface 18. See Figure 12 and page 7, lines 19-23 of the present specification. In sharp contrast, as shown in Thomas' Fig. 1(b), inner conductor is not shown as spaced from and suspended over an outer surface, and the outer conductive sheath is not shown as surrounding the dielectric layer.

Applicant has reviewed Thomas' entire disclosure (Sections 3.5.1-3.5.3) and note that it fails to teach or suggest the above-recited structure of claim 35. None of the other references of record supply the above-noted deficiencies of Thomas.

The Office Action refers to Inoue to supply the deficiencies of Thomas. Inoue merely discloses a semiconductor device having an improved air bridge structure. In addition to the above-noted deficiencies of Thomas, Inoue fails to teach or suggest forming a dielectric layer and an outer conductive sheath, as (correctly) observed on page 5, section 8 of the Office Action dated 12/13/2002.

At least for the above-noted reasons, neither Thomas nor Inoue, taken alone or in combination, teach or suggest all the elements of claim 35. Accordingly, claim 35 is in condition for allowance. Claims 40-44 depend from

claim 35 are further limit the scope of claim 35 in a patentable sense. Such dependent claims are therefore allowable.

Claim 36 further recites, in part, a pair of spaced-apart terminal members disposed over the outer surface and extending elevationally away therefrom, and an inner conductive core operably connected with and suspended between the spaced-apart terminal members above the outer surface.

Claims 36 and 37 are patentably distinct over the combination of Thomas and Inoue and Val at least for the above-noted reasons set forth with regard to claim 35 as none of the references teach or suggest all the limitations of claim 36 and 37.

Page 3 of the Office Action while acknowledging the deficiencies of Thomas asserts that Inoue supplies such deficiencies. Applicant further respectfully traverses this assertion in addition to the above-noted reasons provided above with regard to claim 35.

As set forth above, Thomas fails to teach or suggest an inner conductive core. Inoue fails to teach or suggest an inner conductive core spaced from and suspended over the outer surface further in view of the following:

Inoue discloses a semiconductor device having an air bridge structure. The Office Action alleges that Inoue teaches “a copper-comprising layer 17 having a thickness of between about 100 to 200 nm...wherein the copper comprising layer 17 and the conductive layer 20 comprise an inner conductive core spaced from and suspended over the outer surface.” Applicants respectfully disagree.

Inoue's lower layer 17 is not made of copper – rather it is made of W. See col. 3, line 65. Also, the thickness of layer 17 is not between 100 to 200 nm – it is 1000 Angstroms – equal to 100 nm. See col. 3, line 66. Furthermore, layer 17 and a second layer 20 do not comprise an inner conductive core that is spaced apart and suspended over the outer surface. The second layer 20 is selectively formed over layer 17 to obtain an air bridge 21. See Inoue's Fig. 1D and col. 4, lines 10-25. Layers 17 and 20 do not constitute an inner conductive core as recited in claim 36. Inoue's layer 14 is a lead layer that is formed on insulating film 13. It fails to teach or suggest a pair of spaced-apart terminal members disposed over the outer surface and extending elevationally away therefrom. See, for example, Figure 5 of the present specification where a pair of terminal members 20, 21 are shown that are spaced-apart and extending elevationally away from the outer surface of the substrate. Inoue fails to teach or suggest such a structure.

Since Inoue fails to teach or suggest the pair of terminal members, the question of having an inner conductive core that is operably connected with and suspended between spaced-apart terminal members above the outer surface as recited in claim 36 does not even arise.

In addition to the above-noted deficiencies, Inoue fails to teach or suggest forming a dielectric layer and an outer conductive sheath as recited in claim 36 and acknowledged on page 5, section 8 of the Office Action dated 12/13/2002.

In view of the foregoing, neither Thomas nor Inoue, taken alone or in combination, teach or suggest all the limitations of claim 36. Accordingly, claim 36 is in condition for allowance.

Furthermore, it is well-established that under 35 U.S.C. §103, teachings of references can be modified/combined only if there is some teaching, suggestion or incentive to do so. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. Here, the prior art of record fails to provide any such suggestion or incentive.

The Office Action refers to Val to supply the deficiencies of Thomas and Inoue.

Val discloses a method of producing coaxial connections for an electronic component. The Office Action asserts Val as teaching “an outer conductive sheath surrounding a substantial portion of the polymer dielectric layer, wherein the outer conductive sheath is not formed on the outer surface” as recited in claims 35 and 36. The Examiner’s assertion is erroneous.

As correctly acknowledged by the 12/13/2002 Office Action on page 6, Val fails to teach or suggest that the outer conductive sheath leaves some void space between the outer conductive sheath and the outer surface. As observed by the Examiner, if Val fails to teach or suggest such claim feature, it cannot now teach or suggest the above-recited features of claims 35 and 36. The following reasoning is additionally provided the Applicant in support thereof.

Firstly, Val teaches that the base E is formed on ceramic and comprises portions 11,12, and 13. See col. 1, lines 64-66. Therefore, the outer surface that the Examiner allegedly refers to has to be the outer surface of the ceramic base E. It cannot therefore be an outer surface of the semiconductive substrate as in claims 35 and 36.

Secondly, claims 35 and 36 recite that the outer conductive sheath is provided surrounding a substantial portion of the polymer dielectric layer. The Office Action allegedly states that “outer conductive sheath (24) surrounding a substantial portion of the polymer dielectric layer (21)....” However, Val’s col. 2, lines 19 – col. 3, line 23 and Figs. 2a-2c show parylene layer 21 as surrounding layer 24. On the other hand, if F is the inner conductive core as interpreted by the Examiner and layer 24 (interpreted by the Examiner as the outer conductive sheath) is provided on F (See Val’s Fig. 2c), in such a scenario, the outer conductive sheath is not formed to surround the parylene layer 21.

However, in claims 35 and 36, the outer conductive sheath surrounds a substantial portion of the polymer dielectric layer. Figures 12-13 of the present specification provide further clarity to this claim feature.

In addition to the above, Val appears to provide the allegedly interpreted outer conductive sheath 24 underneath the allegedly interpreted inner conductive core F. By providing an outer conductive sheath 24 both inside the parylene layer 21 and outside of it, Val teaches away from claims 35 and 36.

Thirdly, even for argument sake, if one performs a hindsight reconstruction using Applicant’s disclosure and assumes that the outer conductive sheath is not

formed on the outer surface, it would have to be the outer surface of the ceramic base – not the outer surface of the semiconductive substrate.

In view of the above, even if the teachings of Val are combined with the teachings of Thomas and Inoue, all the elements of claims 36 and 37 are not met. Accordingly, claims 36 and 37 are patentably distinct over the prior art references. Withdrawal of rejection of claims and an early notice of allowance is respectfully urged. Claims 45-49 depend from claim 36 and further limit the scope of claim 36 in a patentable sense. Such dependent claims are therefore allowable.

Claims 50, 56, and 62 recite, in part, "...an outer conductive sheath leaving some void space...." As shown above, the 12/13/02 Office Action expressly acknowledged this deficiency of Val, and as explained above with regard to claim 35, neither Thomas nor Inoue cure this deficiency. Accordingly, claims 50, 56, and 62 are in condition for allowance. As claims 51-55 depend from claim 50, claims 57-61 depend from claim 56, and claims 63-65 depend from claim 62, they too are in condition for allowance.

New claim 66 is allowable for at least the reasons set forth above with respect to claims 36, 37, 50, and 56 as noted above. Moreover, new claim 66 further recites that the void space be formed by removing masking material from elevationally below conductive material portions extending between the terminal members. None of the references either alone or in combination teach or suggest this additional feature. Accordingly, claim 66 is in condition for allowance.

New claim 67 recites, in part, an outer conductive sheath completely surrounding the polymer dielectric layer. None of the references of record teach or suggest this claim feature. Claim 67 is therefore allowable.

Applicant appreciates the Examiner's acceptance of the corrected drawing (Figure 13) submitted on September 13, 2002. Applicant notes that the PTO-326, form, Paragraph No. 11, of this Office Action, states that "if approved, corrected drawings are required in reply to this Office action." Applicant submitted a Substitute Drawing Request to the Official Draftsman on September 13, 2002 (copy enclosed), which accompanied the Office Action Response of the same date. Therefore, it is believed that no further formal drawing is needed.

It is believed that this application is in immediate condition for allowance, and action to that end is requested. In view of the foregoing, allowance of claims 35-37, 40-63 and 65 is earnestly solicited.

The Examiner is requested to phone the undersigned in the event that the next Office Action is one other than a Notice of Allowance. The undersigned is available for telephone consultation at any time.

Respectfully submitted,

Dated: August 4, 2003 By: K. Sath
Satheesh Karra
Reg. No. 40,246